

Claims

- [c1] What is claimed is:
 - A microfluidic device comprising:
 - a first compartment and a second compartment coupled by a region having micron sized grooves, where said first compartment is capable of being fluidically isolated from said second compartment via hydrostatic pressure.
- [c2] The microfluidic device of claim 1 wherein said first compartment comprises a somal compartment.
- [c3] The microfluidic device of claim 2 wherein said second compartment comprises a neuritic compartment.
- [c4] The microfluidic device of claim 3 wherein neuron processes grow from said first compartment to said second compartment.
- [c5] The microfluidic device of claim 4 where insults introduced to said second compartment stay substantially within said second compartment.
- [c6] The microfluidic device of claim 4 where patterned lines enable targeted growth of said neuron processes.

- [c7] The microfluidic device of claim 6 wherein said patterned lines comprise polylysine.
- [c8] The microfluidic device of claim 1 wherein said microfluidic device is covalently bonded to glass via air plasma treatment.
- [c9] The microfluidic device of claim 1 wherein said microfluidic device is pressed to a culture dish to create a water-tight seal.